

Claims

What is claimed is:

1. A power system, comprising:
an engine having a first coolant circuit;
a torque converter operatively connected to the engine and in fluid communication with the first coolant circuit; and
at least one auxiliary power unit having a second coolant circuit,
wherein the first coolant circuit is in fluid communication with the second coolant circuit.
2. The power system of claim 1, further including a starter/generator operatively connected to the engine and in fluid communication with the first coolant circuit.
3. The power system of claim 1, further including at least one cabin, the at least one cabin having a third coolant circuit, wherein the third coolant circuit is in fluid communication with the first and second coolant circuits.
4. The power system of claim 3, further including at least one valve in fluid communication with the first, second, and third coolant circuits, the at least one valve being movable between a first position where fluid from at least one of the first and second coolant circuits flows through the third coolant circuit and a second position where fluid is blocked from flowing through the third coolant circuit.
5. The power system of claim 3, further including at least one heat exchanger in fluid communication with the third coolant circuit, the heat

exchanger configured to transfer heat from the third coolant circuit to air blown into the at least one cabin.

6. The power system of claim 4, further including:

at least one temperature sensor disposed in the at least one cabin;

and

a controller in communication with the at least one valve and the at least one temperature sensor, wherein the controller is configured to move the at least one valve between the first position and the second position in response to a signal from the at least one temperature sensor.

7. The power system of claim 1, further including at least one thermostat in fluid communication with the second coolant circuit, wherein the at least one thermostat is configured to allow a flow of coolant from the second coolant circuit to the first coolant circuit when a temperature of the second coolant circuit is above a predetermined value.

8. The power system of claim 1, further including:

at least one heat exchanger in fluid communication with the first coolant circuit; and

at least one thermostat in fluid communication with the first coolant circuit and the at least one heat exchanger, wherein the at least one thermostat is configured to allow a flow of coolant to the at least one heat exchanger when a temperature of the first coolant circuit exceeds a predetermined temperature.

9. The power system of claim 8, further including:

at least one temperature sensor in fluid communication with the first coolant circuit;

at least one pump in fluid communication with at least one of the first and second coolant circuits, the pump operable to cause a flow of coolant;

at least one fan proximally disposed relative to the at least one heat exchanger and configured to blow air across the heat exchanger; and
a controller in communication with the at least one temperature sensor and at least one of the at least one pump and the at least one fan, wherein the controller is configured to change at least one of an operation of the at least one fan and an operation of the at least one pump in response to a signal from the at least one temperature sensor.

10. The power system of claim 3, further including at least one check valve in fluid communication with the third coolant circuit and at least one of the first coolant circuit and the second coolant circuit.

11. The power system of claim 1, further including an oil cooler operatively connected to the engine and in fluid communication with the first coolant circuit.

12. The power system of claim 1, further including at least one check valve operatively disposed between the torque converter and the first coolant circuit.

13. A power system, comprising:
an engine having a first coolant circuit;
a starter/generator operatively connected to the engine and in fluid communication with the first coolant circuit; and
at least one auxiliary power unit having a second coolant circuit,
wherein the first coolant circuit is in fluid communication with the second coolant circuit.

14. A method of cooling a power system, comprising:
operating an auxiliary power unit having a cooling circuit;
pumping coolant through the auxiliary power unit cooling circuit;

directing the coolant from the auxiliary power unit cooling circuit to a cooling circuit of a main engine; and

directing a coolant from the main engine cooling circuit to at least one of a torque converter and a starter generator.

15. The method of claim 14, further including allowing the coolant from the auxiliary power unit cooling circuit to flow to the main engine cooling circuit when the temperature of the coolant in the auxiliary power unit cooling circuit is above a predetermined value.

16. The method of claim 14, further including directing the coolant from the main engine cooling circuit through a heat exchanger when the temperature of the coolant in the main engine cooling circuit is above a predetermined value.

17. The method of claim 16, further including:
sensing a temperature of the coolant in the main engine coolant circuit;

actuating a fan to blow air across the heat exchanger; and
actuating a pump to cause the coolant in the main engine coolant circuit to flow; and

changing at least one of an operation of the fan and an operation of the pump in response to a signal indicative of temperature of the coolant in the main engine coolant circuit.

18. The method of claim 14, further including directing coolant from at least one of the auxiliary power unit and main engine coolant circuits to a third coolant circuit to heat at least one cabin.

19. The method of claim 18, further including:
sensing a temperature of the at least one cabin; and

moving at least one valve, in response to the temperature, between a first position where coolant is allowed to flow through the third circuit and a second position where coolant is blocked from flowing through the third circuit in response to the temperature.

20. A work machine, comprising:
a traction device;
at least one cabin supported by the traction device;
an engine configured to drive the traction device, the engine having a first coolant circuit;
a torque converter operatively connected to the engine and in fluid communication with the first coolant circuit; and
at least one auxiliary power unit having a second coolant circuit, wherein the first coolant circuit is in fluid communication with the second coolant circuit.

21. The work machine of claim 20, further including a starter/generator operatively connected to the engine and in fluid communication with the first coolant circuit.

22. The work machine of claim 20, wherein the at least one cabin includes a third coolant circuit, wherein the third coolant circuit is in fluid communication with the first and second coolant circuits.

23. The work machine of claim 22, further including at least one valve in fluid communication with the first, second, and third coolant circuits, the at least one valve movable between a first position where fluid from at least one of the first and second coolant circuits flows through the third coolant circuit and a second position where fluid is blocked from flowing through the third coolant circuit.

24. The work machine of claim 22, further including at least one heat exchanger in fluid communication with the third coolant circuit, the heat exchanger configured to transfer heat from the third coolant circuit to air blown into the at least one cabin.

25. The work machine of claim 23, further including:
at least one temperature sensor disposed in the at least one cabin;
and

a controller in communication with the at least one valve and the at least one temperature sensor, wherein the controller is configured to move the at least one valve between the first position and the second position in response to a signal from the at least one temperature sensor.

26. The work machine of claim 20, further including at least one thermostat in fluid communication with the second coolant circuit, wherein the at least one thermostat is configured to allow a flow of coolant from the second coolant circuit to the first coolant circuit when a temperature of the second coolant circuit is above a predetermined value.

27. The work machine of claim 20, further including:
at least one heat exchanger in fluid communication with the first coolant circuit; and

at least one thermostat in fluid communication with the first coolant circuit and the at least one heat exchanger, wherein the at least one thermostat is configured to allow a flow of coolant to the at least one heat exchanger when a temperature of the first coolant circuit exceeds a predetermined temperature.

28. The work machine of claim 27, further including:
at least one temperature sensor in fluid communication with the first coolant circuit;

at least one pump in fluid communication with at least one of the first and second coolant circuits, the pump operable to cause a flow of coolant;

at least one fan proximally disposed relative to the at least one heat exchanger and configured to blow air across the heat exchanger; and

a controller in communication with the at least one temperature sensor and at least one of the at least one pump and the at least one fan,

wherein the controller is configured to change at least one of an operation of the at least one fan and an operation of the at least one pump in response to a signal from the at least one temperature sensor.